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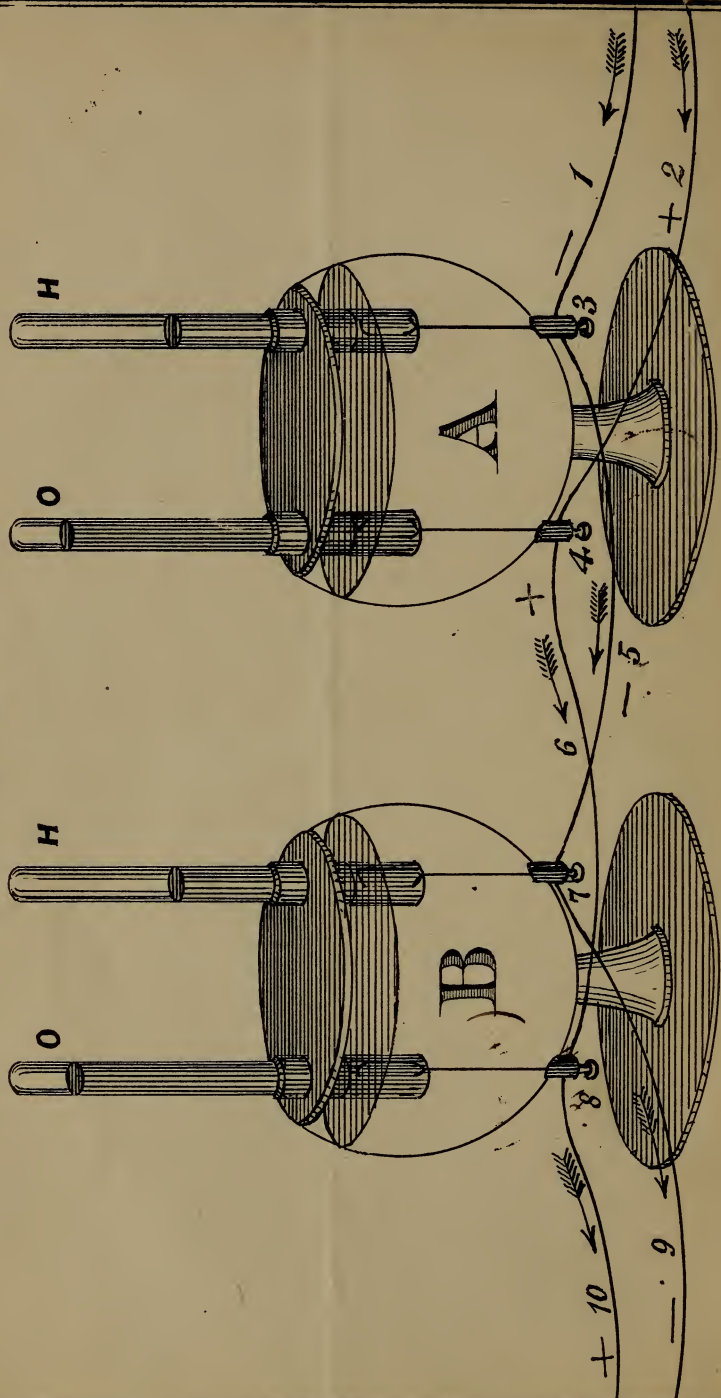
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✓ basselberry



FIG. 1.



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A DISCOVERY
IN THE
SCIENCE OF ELECTRICITY,
MADE BY
EVANS CASSELBERRY. OF ST. LOUIS.

The following is the explanation and description of a discovery which I have made in the science of electricity, and an explanation and description of the apparatus, instruments, process, and method, by which I demonstrated and proved the same.

SECTION I.

Description of the Apparatus and Instruments used in Demonstrating and Proving the Discovery.

The vessels A and B (Fig. 1) are glass vessels, usually called "decomposing cells," with lids or covers also of glass. Through each of the glass lids or covers are inserted two glass tubes, O and H, closed at the upper ends or tops so as to be air and gas tight.

The vessels A and B are filled nearly full with water, diluted or mixed with a small quantity of sulphuric acid so as to facilitate decomposition. The glass tubes are also filled to the top with the same water that is in the vessels.

The negative [—] wire 1 connects the binding screw 3 of vessel A with the negative pole of a galvanic or voltaic

QC 561
C 34

battery, or with a magneto-electric machine, sufficiently powerful to decompose water easily, and the positive $[+]$ wire 2 connects the binding screw 4, which enters vessel A with the positive pole of the same battery or machine.

The screw 3, which enters vessel A, connects by wire 5 (conducting negative $[-]$ electricity) with screw 7 which enters vessel B. The screw 4 of vessel A connects by wire 6 (conducting positive $[+]$ electricity) with screw 8 in vessel B.

All of the wires and screws are metallic. The screws 3 and 4, in the bottom of vessel A, each connects inside of vessel A with a platina wire. The screws 7 and 8, in the bottom of vessel B, each connects inside of vessel B with a platina wire.

The wires inside of both vessels are made of platina, because platina is a metal that will not oxydize, rust, or corrode, nor will it combine with any substance which is in the water.

Such parts of the wires as are inside of the decomposing cells ought to be precisely of the same length, thickness, and size in every respect, so that the wires in one cell will present the same quantity of metallic surface to the liquid as the wires in the other cell. If the wires do not present the same quantity of metallic surface to the liquid in each cell, the quantity of gas in the tubes of one cell will be greater than the quantity of gas in the tubes in the other cell; that is to say, there will be more oxygen gas in the oxygen tube of one cell than in the oxygen tube in the other cell, and there will be more hydrogen gas in the hydrogen tube of one cell than in the hydrogen tube of the other cell.

From the above and foregoing description, it will be seen that vessels A and B, and the tubes, wires, and screws connected with them, are exactly of the same size, and are precisely alike in every respect whatever.

The number of decomposing cells similar to vessels A and B may be increased to any extent that may be desired, and connected together in regular succession in the same manner in every respect that vessels A and B are connected. The wires connecting binding screws 7 and 8, which are inserted in vessel B, show where and how the wires may be attached to connect the additional number of vessels.

SECTION II.

Experiments with the Galvanic Battery.

I attached to the respective poles of a galvanic battery the respective wires 1 and 2, which connect with the binding screws 3 and 4 in vessel A, and ejected into the vessel a negative current on the negative wire 1, and a positive current on the positive wire 2. These currents decomposed liquid in vessel A, and produced in *two* minutes *four* inches of hydrogen gas in tube H in vessel A, and *two* inches of oxygen gas in tube O in vessel A, whilst the two wires, 5 and 6, connecting vessels A and B, were detached from vessel A, so that vessel A, during the experiment, had no connection whatever with vessel B.

I then attached both vessels together by fastening the respective wires 5 and 6 to the respective binding screws 3 and 4 in vessel A, and to the respective binding screws 7 and 8 in vessel B. Having thus attached both vessels together, I then again attached, as before, the respective poles of the same galvanic battery to the respective wires 1 and 2, which connect with the respective binding screws 3 and 4 in vessel A, and again ejected into the vessel a negative current on the negative wire 1, and a positive current on the positive wire 2. These currents decomposed liquids in both vessels, and produced in *two* minutes *four* inches of hydrogen gas in *each* of the tubes marked H in vessels A and B (being *eight* inches of hydrogen in the aggregate),

and *two* inches of oxygen gas in *each* of the tubes marked O in vessels A and B (being *four* inches of oxygen in the aggregate).

The number of cups, or pairs, in the galvanic battery which I used in trying the experiments mentioned in this section were neither increased nor diminished during the time of trying the experiments, but always remained the same, so that the quantity of zinc consumed, and the quantity of electric force exerted, or expended during any given time, whilst trying the experiments, were always the same.

The experiments in this section show that a galvanic battery, when attached to two decomposing cells in the manner hereinbefore described, produces twice the quantity of gas in two minutes that the same battery (containing the same number of cups or pairs) produces during the same time when attached to only one decomposing cell.

SECTION III.

Experiments with a Magneto-Electric Machine.

I procured a "magneto-electric machine" sufficiently powerful to decompose water, and attached to the respective poles of the machine the respective wires 1 and 2, which connect with the binding screws 3 and 4 in vessel A, and ejected into the vessel a negative current on the negative wire 1, and a positive current on the positive wire 2. These currents decomposed liquid in vessel A; and 211 turns of the crank of the machine produced *four* inches of hydrogen gas in tube H of vessel A, and *two* inches of oxygen gas in tube O of vessel A, whilst the two wires, 5 and 6, connecting vessels A and B, were detached from vessel A, so that vessel A, during the experiment, had no connection whatever with vessel B.

I then attached both vessels together by fastening the respective wires 5 and 6 to the respective binding screws

3 and 4 in vessel A, and to the respective binding screws 7 and 8 in vessel B. Having thus attached both vessels together, I then again attached, as before, the respective poles of the same magneto-electric machine to the respective wires 1 and 2, which connect with the respective binding screws 3 and 4 in vessel A, and again ejected into the vessel a negative current on ~~the negative~~ wire 1, and a positive wire 2. These currents decomposed the liquids in both vessels, and 211 turns of the crank of the machine produced *four* inches of hydrogen gas in *each* of the tubes marked H in vessels A and B (being *eight* inches of hydrogen in the aggregate), and *two* inches of oxygen gas in *each* of the tubes marked O in vessels A and B (being *four* inches of oxygen in the aggregate).

The experiments in this section show that 211 turns of the crank of a magneto-electric machine, when attached to two decomposing cells in the manner hereinbefore described, produce twice the quantity of gas that the same number of turns of the crank of the same machine produce when attached to only one cell.

SECTION IV.

Experiments by Weighing the Zinc consumed during the Décomposition of the Liquids.

I weighed the zinc consumed during the two minutes the current of the galvanic battery ran into vessel A alone, whilst vessel A was detached from vessel B; and I also weighed the zinc consumed during the two minutes that the current of the same battery ran into vessels A and B whilst the two vessels were connected together in the manner herein described in section one, and I found that there was as much zinc consumed during the two minutes that the current ran from the battery into vessel A alone as there

was consumed during the two minutes that the current ran from the same battery into vessels A and B whilst the two vessels were connected together as described in the above-mentioned section one.

SECTION V.

The Summing up of the Foregoing Experiments, together with a few Miscellaneous Remarks.

It has always heretofore been supposed by scientists, that when the wires of a galvanic battery, or magneto-electric machine, are attached in the usual manner to only one decomposing cell, that all of the electricity liberated by the battery, or machine, which enters the cell is consumed in doing the work of decomposition in this one cell, and that if an additional cell be added, as described in section one, the electricity would be equally divided between the two cells, so that each cell would contain only one-half the quantity of gas that one cell would contain when used alone ; but I discovered that the contrary is true, and that the above supposition is erroneous ; and I also discovered, demonstrated, and proved, that a galvanic battery, when attached to two decomposing cells in the manner described in section two, produces twice the quantity of gas in a given² time that the same battery produces during the same time when attached to only one decomposing cell ; that a given number of turns of the crank of a magneto-electric machine, when¹ attached to two decomposing cells in the manner described in section three, produce twice the quantity of gas that the same number of turns of the crank of the same machine produce when attached to only one cell ; and that there is no more zinc consumed in a given time, whilst the galvanic battery is attached to two decomposing cells, as described in section four, than there is consumed by the same battery dur-

ing the same time when attached to only one cell. Until I discovered the facts above mentioned, they were wholly unknown, and had never been even suggested, hinted, or intimated by any one.

The process, or method of decomposing liquids by electricity, which I have discovered, and which has been hereinbefore fully described and explained, is infinitely cheaper than any other process or method heretofore known.

The experiments mentioned in sections two, three and four herein, are the average results of a very large number of experiments performed by me between the middle of the month of September, 1867, and the middle of the month of September, 1872. I made the discovery *mentally*, however, in the month of September, 1857, but did not, until the middle of the month of September, 1867, as above stated, begin the experiments for the purpose of actually demonstrating the same.

EVANS CASSELBERRY.

ST. LOUIS, Sept. 29, 1873.

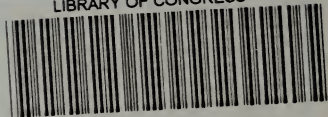
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pH 8.5